A 17th Century Testimony On The Use Of Ceramic Top-bar Hives

H V Harissis and G. Mavrofridis, Greece

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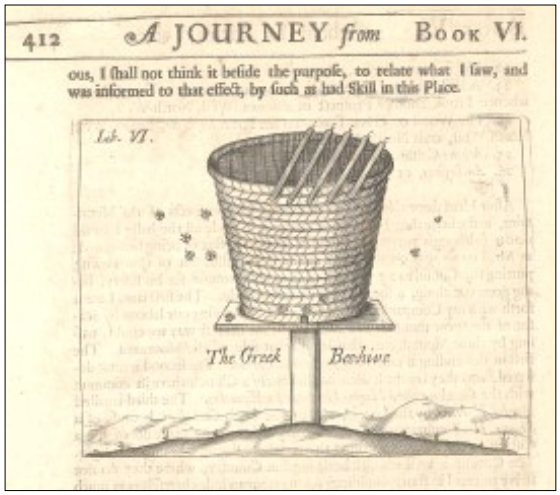
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ous, I shall not think it beside the purpose, to relate what I saw, and was informed to that effect, by such as had Skill in this Place.

Lib. VI.

The Greek Beehive

Fig. 1. Greek top bar hive as illustrated in Sir George Wheler's book: *A journey into Greece* published by T Cademan in London in 1682.

The traditional basket top-bar (movable-comb) hives of Greece, known as "Greek beehives", are considered the forerunners of the modern hives with movable frames that are mainly used today (Crane, 1999). The oldest known written references to top-bar hives are those of the French doctor Jacob Spon, and of the English connoisseur and botanist Sir George Wheler, who, during a joint trip in 1676, saw basket top-bar hives in use by monks in a monastery on mount Hymettus, near Athens. Two years later, Spon (1678) published, in Lyon, the memoirs of his travels, where he included a short reference to these hives. He was followed by Sir George Wheler, who, in his book published in 1682, included an analytical and lengthy description of the hives as well as a drawing (fig. 1).

The wicker top-bar hives of Attica are also mentioned by Charles Thompson (1744). His travels however, proved to be fictional and as far as the hives of Hymettus are concerned, he seems to be copying Wheler (Mavrofridis, 2010). In 1790 Abbot Della Rocca (1790) from Syros based on testimonies of others, described the woven top-bar hives which were used in his time on the island of Crete. There also exist three more references to top-bar basket hives from the 19th century (Galt, 1812; Cotton, 1842; Benton, 1894). All of the above references concern woven top-bar hives. Here we present a unique – and thus far unknown in beekeeping literature – testimony of a ceramic variant of the traditional top-bar hives used in Greece that constitutes the oldest known testimony to such a practice.

In the closing years of the seventeenth century (1696) a 78-year-old refugee called Zuanne Papadopoli, who had fled from his homeland in Crete before its conquest by the Ottomans in 1669, decided to write his memoirs in his adopted city of Padua. *L'occio* (Time of Leisure), as he named his manuscript, contains a wealth of detail on everyday life in the city and district of Candia (modern Herakleion) at the end of Venetian rule. *L' occio*, to our knowledge, was first found and studied by Ioannis Skoulas, a Cretan lawyer who located Papadopoli's manuscript in the Museo Correr in Venice and subsequently made it known to the scholastic community (Skoulas, 1985). In 2007, the full manuscript was published along with an English translation and commentary by Professor Alfred Vincent of the University of Sydney (Papadopoli, 2007). This is how Papadopoli, a beekeeper himself, describes the ceramic top-bar hives that were in use in his time:

> "*In Crete these* [hives] *were earthenware vessels similar to those in which lemon and orange trees are planted, though much smaller and with a lid of the same material, which protruded two fingers breadth all round, for the water to run off the vessel when it rained. At the bottom was the usual hole for the bees to pass in and out and at the top there were placed a number of small lengths of wood (*cantenelle*)* [top-bars] *two fingers in breadth, on top of which they placed the lid. The bees inside made their honeycombs and wax in the usual way in the shape of a* foccaccia, *with every comb attached to its bar. When they wanted to harvest the honey, they would take out one bar at a time and cut out the honeycomb into a large dish. Having cleared the bar they would return it to its place, continuing in this way until they had removed two thirds of the honey. They would leave the remaining bars intact as food for the bees during the winter. (…) At breeding time which was in May and June, when they* [the bees] *were heard making a noise like trumpets sounding the march inside the hives, and some would be swarming outside the container, then a new hive would be prepared, the inside of it rubbed with rosemary and good wine, and fitted with its bars and cover. Towards evening they would uncover the hive, taking out one of the bars on which the bees were crowded together, making sure that there was among them one of their kings* [sic] *which are usually bigger than the other bees, and they would put this bar in the new hive, put on the lid, and leave it* [i.e. the new hive] *close by. In the vacant space from which they had taken the bar, they would put one of the empty bars from the new hive so as to fill up the space. On the following morning the new hive would be almost full of newly-bred bees, which had decamped from the old hive to go to live in the new one, and in a few days it would be completely full, and they would begin to construct the honeycombs on the bars."*

(Translation A. Vincent, 2007 p.188-190; brackets are additions by H. Harissis).

Fig. 2a. The traditional Cretan "Vraski" hive, **Fig. 2b.** An "Ypsèli" hive of the Cycladic island of Kea, **Fig. 2c.** A copy of an ancient hive from Istmia, **Fig. 2d.** Beekeeper I. Tsiminis with movable combs from a copy of ancient hives of Isthmia.

Photos G. Mavrofridis

This type of ceramic top-bar hive described by Papadopoli was until recently in use in Crete where it is known as "Vraski" or "Fraski" (Fig. 2a). These hives generally used pottery lids, exactly like the ones described by Papadopoli, although in some cases, a stone plate was used instead. Apart from Crete, the same type of hive called "Ypsèli" was the pre-eminent hive on the Cycladic island of Kea (Bikos & Rammou, 2002) but it differed from the Cretan "Vraski" in its handles (Fig. 2b) while another type of ceramic top-bar hive was discovered recently on the island of Kythira (Mavrofridis, 2007).

Ceramic upright hives similar to the traditional top-bar variety, dating from Hellenistic times, were discovered in Isthmia, near Korinthos (Anderson-Stojanovic & Jones, 2002) (Fig.2c). Results of experimental beekeeping with copies of these ancient hives (Fig. 2d) leave no doubt that they were top-bar movable-comb hives (Mavrofridis, 2007; Mavrofridis, 2009). Hellenistic ceramic top-bar hives were also found and on the island of Agathonissi (Triantafyllidis, 2010). Also, ancient hives, being dated between the Archaic (750 - 480 B.C.) and the Hellenistic (323 - 31 B.C.) periods, from Athens (Anderson-Stojanovic & Jones, 2002) and from the islands of Delos (Crane, 1999) and Chios (Sutton, 1991) most probably belong to the type of upright hive in question.

Prehistoric upright ceramic vessels of similar shape, dated between the 18th and 15th century B.C., discovered in Crete and other islands of the south Aegean Sea, were suggested to be beehives (Melas, 1999). The above vessels, if they are in fact hives (we will not have a final proof until their residues are chemically tested) could be top-bar hives (Mavrofridis, 2007; Harissis & Harissis, 2009). A ceramic vessel from the Palace of Knossos, belonging to a lot consisting of different kinds of beekeeping paraphernalia, but until recently unidentified as such can, in all probability, be identified with a top-bar beehive (Harissis & Harissis, 2009). Thus, the above 17th century testimony of Papadopoli belongs to an uninterrupted Greek beekeeping practice that is at least three thousand years old.

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Eva Crane Memorial Award 2011

Norman Carreck

The annual Eva Crane Memorial Prize is awarded to the best, most innovative and scientifically exciting, article published in the Journal of Apicultural Research, *as judged by the current international panel of Editors.*

The winning paper for 2011 is the original research article:

"*Nosema ceranae* development in *Apis mellifera*: influence of diet and infective inoculum"

The authors are: Martín Porrini, Edgardo Sarlo, Sandra Medici, Paula Garrido, Darío Porrini, Damiani Natalia and Martín Eguaras of the Universidad Nacional de Mar del Plata, Argentina.

The Science

To investigate the effect of the nutritional condition of the honey bee on the development of *Nosema ceranae* under laboratory conditions, newly emerged bees were confined and fed on three *ad libitum* diets: high fructose corn syrup (HFCS) + fresh bee bread; HFCS + a commercial mixture of amino acid and vitamin, and HFCS. On day 7 post-emergence, bees from each diet treatment were individually infected with several rates of spores of *N. ceranae*. At intervals, bee midguts were removed to individually quantify the spores developed. The results indicate that the parasite multiplies successfully regardless of the inoculum given or the nutritional status of its host. When bees are fed on pollen, however, the parasite develops quickly, exhibiting significantly higher intensities than under other treatments. The longevity of infected bees fed on the same diet was not affected by the degree of parasitism, but by the quality of the *ad libitum* diet administered. The data demonstrate a parasite development that depends on host-condition. This should be considered when designing experiments to evaluate the development and virulence of this pathogen.

The researchers

Martín Porrini received a bachelor's degree in Biological Sciences at the National University of Mar del Plata, Argentina in 2008. He is currently a PhD student, working on finding alternative substances for the control of *Nosema*. The aim of his laboratory and field research is to develop

products mainly of natural origin which affect the environment as little as possible, and take into account interactions between the parasite, the drug molecules and the physiological status of the host. His research focuses not only on improvements in hive production, but also learning about how these organisms respond to environmental factors.

Over the last twenty years, **The Arthropods Laboratory, Universidad Nacional de Mar del Plata, Buenos Aires, Argentina**, directed by Dr Martín Eguaras, has been doing research on a number of beekeeping problems. From the outset, researches have focused on increasing knowledge to provide practical solutions for beekeepers, as well as initiating research in different new lines of work that contribute to basic science too. The results obtained, about diverse topics related to bee health, have been disseminated in books, scientific journals, protocols and other reference works. Dr Eguaras is convinced that it is possible to incorporate a programme of Integrated Pest Management in productive beekeeping, and recently there has been much progress in areas such as bee physiology and immunity, bioindicators, mite resistance, pesticide residue analysis, and control strategies for the principal pests and pathogens that threaten honey bees. In a country such as Argentina, with different needs and scarce resources, the group has developed an ambitious programme of extension work, providing a wide range of courses, promoting the link between the producers and scientists, and providing technical and scientific advice to several national and international institutions.

Areas of research at the Arthropods Laboratory include: monitoring and control of Varroosis (Dr Jorge Marcangeli, Dr Sergio Ruffinengo, Dr Matias Maggi, Dr Natalia Damiani, and Gustavo Velis); monitoring and control of American foulbrood (Dr Liesel Gende, Dr Sandra Fuselli and Natalia Fernandez); monitoring and control of Nosemosis (Dr Gabriel Sarlo and Martin Porrini); residues in hive products Dr Sandra Medici); bee physiology and nutrition (Dr Gabriel Sarlo, Melisa Garrido, Peter (Pedro) Negri, Dr Sandra Medici, Dr Natalia Damiani), and pollination (Leonardo De Feudis and Fiorella Del Piano). Areas in development include: the study of probiotics in beekeeping and their relationship with bee health and disease tolerance; the use of bees as environmental biomonitors including the determination of heavy metals and pesticides; and computer simulation of honey bee colonies (Mario Migueles).

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